



Russell Williams  
Chairperson, Negaunee

David E. Hall  
Vice Chair, Ewing

Darryll Sundberg  
Member, Ishpeming

Joseph Valente  
Member, Marquette

Neil W. Anderson  
Member, Ishpeming

James M. Iwanicki, P.E.  
Engineer-Manager

September 14, 2012

Mr. Steve Casey, District Supervisor  
Department of Environmental Quality  
Water Resources Division  
420 5<sup>th</sup> Street  
Gwinn, MI 49841-3004

Re: Revised Plans and Response to DEQ letter of September 4, 2012  
MDEQ File No. 11-52-0075-P; Proposed CR 595

Dear Steve:

Enclosed please find revised project plans for the above-referenced project. These plans have been revised from those submitted to you on July 24, 2012 in the following general manner.

The location and length of some of the passing lane sections have been modified to reduce wetland impacts from those previously presented in our most recent submittal of July 24, 2012 by approximately 0.30 acres as described in detail below. Also, an unintended consequence of performing an internal quality control exercise of all wetland impacts depicted on the drawings resulted in a reduction of approximately 0.03 acres of wetland impact that had been reported in previous submittals. This additional minor reduction in wetland impacts is the summation total of various minor additions and subtractions throughout the drawings and can be attributed to several iterations of project plans over that last several months. In addition, numerous minor revisions have been made to the plans to address the treatment of storm water. These minor revisions were made as a result of responding to comments received during your review, as well as our internal project team plan review process over the past several weeks.

In addition, the clarification that you requested from Marquette County Road Commission (MCRC) in your letter dated September 4, 2012 regarding the proposed CR 595 project is provided below. Your requests are provided in *italics* followed by our response.

*Item 5) Since proposed CR 595 is anticipated to be a low traffic volume road, please further clarify why a modified primary county road design would not meet the purpose points in table 3-8 of the application (included in your letter). Other primary county roads have been upgraded and/or rebuilt to lower design speeds, such as 45 miles per hour (vs. the "typical" 55 mph design). This alternative may also reduce wildlife vehicle strikes, according to previous Department of Natural Resources comments on the proposed road.*

**MCRC Response:**

You refer above to CR 595 as a "low traffic volume road", which is true, but traffic volume does not determine whether a road is a primary county road. CR 595 is designed as a primary county road because it connects various local roads to a main arterial (i.e. US-41) and it will

also have a combination of commercial, residential, and recreational traffic. MCRC's project purpose is to build a county primary road.

With regard to traffic speed, there are two types of alignment revisions that affect that speed, horizontal and vertical. If the design speed is lowered by changing the horizontal alignment by tightening the curves which in turn reduces the sight distance around the curve. The posted speeds in those areas would still be 55 mph due to Michigan law, but yellow speed advisory signs would be placed on those curves.

If the design speed is lowered by changing the vertical alignment, the road grades would be steeper, creating a shorter sight distance when traffic crests over the hills. Changes in vertical alignment would also not change the posted speed limit of 55 mph, but yellow advisory signs may be placed to warn drivers. To help understand how speed limits are determined, a document titled "Establishing Realistic Speed Limits" prepared by the Michigan Department of Transportation (MDOT) is enclosed.

In either case wildlife mortality is likely to be similar. Although vehicles might be traveling somewhat slower due to the curves, which will decrease stopping sight distances and the sight distance to see animals in or near the roadway will be greatly reduced. Reaction times to see the animals will remain the same. Likewise, wildlife will have shorter reaction times to avoid traffic.

In regard to MDNR comments, we have met with MDNR staff and have proposed measures for CR 595 to reduce and monitor wildlife mortality. If wildlife mortality monitoring dictates it, additional mitigation measures will be implemented in coordination with MDNR.

*Item 6 – As identified in your August 16, 2012, letter, the proposed passing lanes would directly impact 1.38 acres of wetland, including 0.84 acres of rare S-3 wetlands. Per Item 5 above, it also appears that the four proposed passing lanes could potentially be reduced in number and/or length due to anticipated low traffic volumes and applicable AASHTO standards. This would minimize disruption to the aquatic resources, and in particular to rare wetland communities.*

*Also, please provide the reasoning for selection of the proposed passing lane locations and lengths. Please clarify whether a design with less and/or shorter passing lanes has been examined, and provide the corresponding documentation if it has been determined to not be feasible or prudent to reduce the length and/or number of proposed passing lanes. Also please clarify why passing lanes instead of truck climbing lanes are proposed, and describe the difference in these types of extra lane design, as applicable to the anticipated truck flow rate, anticipated traffic volume, and proposed road length.*

**MCRC Response:**

The truck climbing lane/passing lane issue was previously addressed to some extent in MCRC's August 16, 2012 response to an August 13, 2012 letter from Steve Casey to Jim Iwanicki. Item 6 below was in the MDEQ August 13, 2012 letter:

- 6) At least one of the truck climbing lanes impacts an S-3 Rich Conifer Swamp (Station 1300). We should have detailed information on how much wetland impact results from the proposed truck climbing lanes and the details on how they were located along the route and whether some could be eliminated and/or moved to avoid the wetland impacts.*

The following indented language is the pertinent part of the August 16 MCRC response to item 6 in the letter from Jim Iwanicki to Steve Casey and is provided here for reference purposes:

An explanation of the CR 595 design methodology is found in the AAPA on Page 70 of 314 (excerpted below).

“Locations where passing lanes are appropriate are determined from MDOT Michigan Road Design Manual, Volume 3, Section 3.09.05(C). The Passing Lane selection criteria are:

- Long, continuous grade where the length of the passing lane is a minimum of one mile in length;
- Directional spacing of passing lanes of approximately five miles;
- Locate in areas to avoid environmental impacts to the extent feasible;
- Vertical grades are present to enhance passing opportunities between slow and fast traffic.”

The preceding information is part of the basis of design of the road. Please note that designated “passing” areas are based on Passing Lane Criteria and not Climbing Lane Criteria. The enclosed Detail Sheet D, as well as the Plan and Profile Drawings, previously refer to “climbing lanes” but have now been revised to say “passing lanes”.

In response to Item 6 in the September 4, 2012 letter, MCRC offers the following response, beginning with a discussion about the design criteria used and followed by explanation of revisions that have been made to the proposed passing lanes as suggested by MDEQ:

Passing lane sections are proposed on CR 595 in lieu of truck climbing lanes due to their flexibility in application in order to respond to local terrain, anticipated traffic volume, and environmental concerns. Truck climbing lanes are recommended for traffic volumes larger than 200 vehicles per hour and/or 20 large trucks per hour, which is not applicable on CR 595. Pages 32 and 33 of the AA/PA dated July 24, 2012 provide information on the existing and expected traffic on CR 595. Average daily traffic on CR 595 is forecasted to be 446 vehicles per day.

The American Association of State Highway Transportation Officials (AASHTO) publication “A Policy on Geometric Design of Highways and Streets” 2004 Edition, also known as the “Greenbook” (and hereinafter in this document referred to as such) is the nationally recognized standard for the design of roadways in the United States. In addition, MDOT publishes a “Road Design Manual”. This Road Design Manual is based on AASHTO standards and includes additional design guidance based on MDOT policy and the relative geography of Michigan compared with other States.

Section 3.09.05 (Guidelines for Passing Relief Lanes) of the MDOT Road Design Manual states that:

“A Passing Relief Lane, which is either a Truck Climbing Lane or a Passing Lane Section, is intended to reduce congestion and improve operations along two-way, two-lane, rural highways. The congestion (platoon forming) being addressed is the result of:

(1) speed reduction caused by heavy vehicles on prolonged vertical grades and/or, (2) slow moving motorists in combination with high traffic volumes or roadway alignment limiting passing opportunities. Platoons forming behind slow moving vehicles can be reduced or dispersed by increasing the opportunities to pass them. The conditions that cause the forming of platoons also restrict the passing opportunities needed to dissipate platoons, thereby increasing congestion.”

The MDOT Road Design Manual continues on to discuss criteria for both Truck Climbing Lanes and Passing Lane Sections. If criteria are satisfied, the inclusion of passing relief lanes as part of a project would be considered, but not required per the design standards. The proposed CR 595 will not meet Criteria for Truck Climbing Lanes based on traffic, truck flow rate or Level of Service conditions described in the MDOT Road Design Manual. However, the proposed CR 595 does meet the criteria for Passing Lane Sections described in Section 3.09.05C as follows:

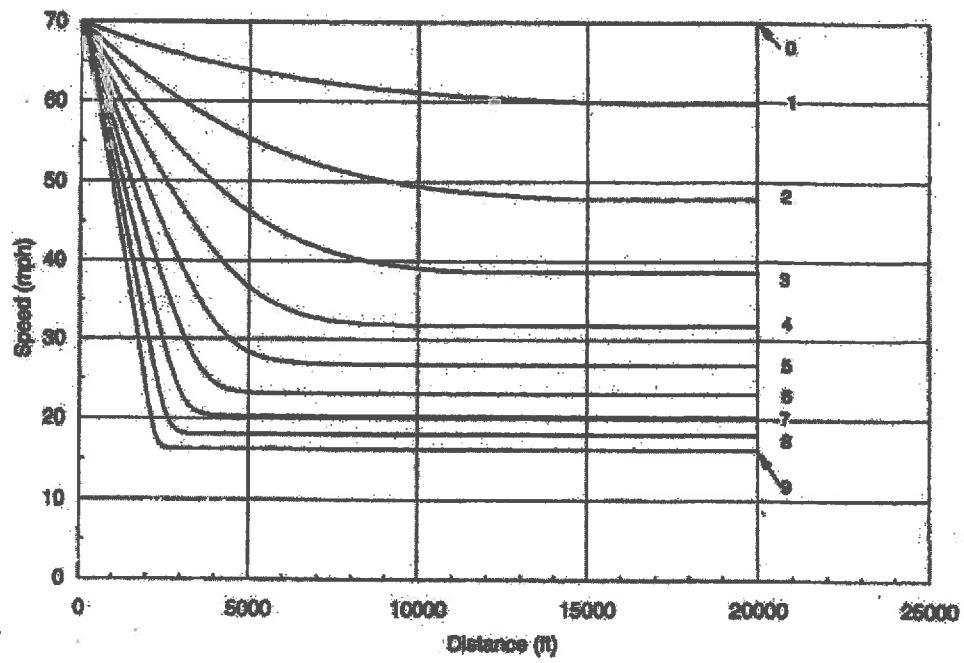
1. Combined recreational and commercial volumes exceed five percent of total traffic.
2. The Level-of-Service drops at least one level and is below Level B during seasonal, high directional splits.
3. The two-way Design Hour Volume (DHV) does not exceed 1200 vehicles per hour (vph). In situations where volumes exceed 1200 vph, other congestion mitigating measures should be investigated.

The proposed CR 595 satisfies conditions 1 and 3 above and arguably will satisfy condition 2 when Level-of-Service (as explained by MCRC on Page 36 of the Revised Alternatives Analysis & Project Assessment) is considered. Therefore, it is appropriate to include Passing Lane Sections as a measure to provide for vehicle safety. Safety of the travelling public is always a consideration when designing road projects. In the case of CR 595, a large portion of the road will be classified as a “No Passing Zone” due to horizontal and vertical curves along the alignment; therefore passing lane sections-would minimize the risks to drivers who will attempt to overcome slower moving vehicles. Essentially, if a driver is made aware that there are passing lanes on the road up ahead due to advisory signs being placed on the road, drivers will be more likely to wait for a passing opportunity.

Additionally, the aforementioned AASHTO Greenbook explains the Critical Length of Grade for Design and the effect critical grades have on crashes. For example, on Page 239 it is stated that: “Studies show that, regardless of the average speed on the highway, the more a vehicle deviates from the average speed, the greater its chances of becoming involved in a crash.”

Exhibit 3-55 from the AASHTO Greenbook displayed below illustrates the anticipated deceleration of a typical heavy truck on varying percentages of incline as indicated on the right side of the graph (0%-9%). In addition, Exhibit 3-57 displayed further below illustrates the anticipated deceleration of a typical recreational vehicle on varying degrees of incline. In the case of either trucks or recreational vehicles traversing the rolling terrain encountered along the proposed CR 595, those vehicles will unavoidably experience substantial deceleration on up-hill grades.

US CUSTOMARY

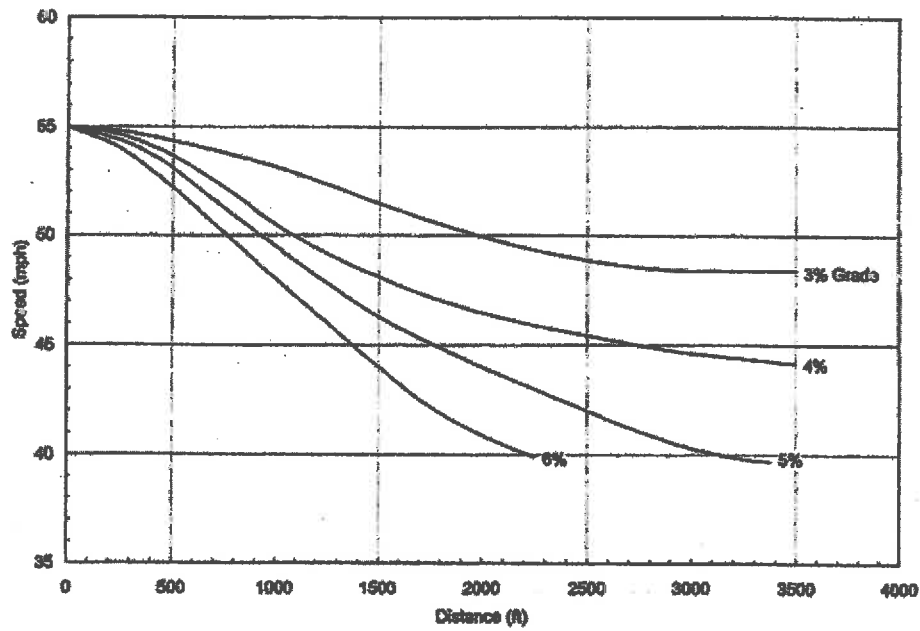


**Exhibit 3-55. Speed-Distance Curves for a Typical Heavy Truck of 120 kg/kW [200 lb/hp] for Deceleration on Upgrades**

---

US CUSTOMARY

---



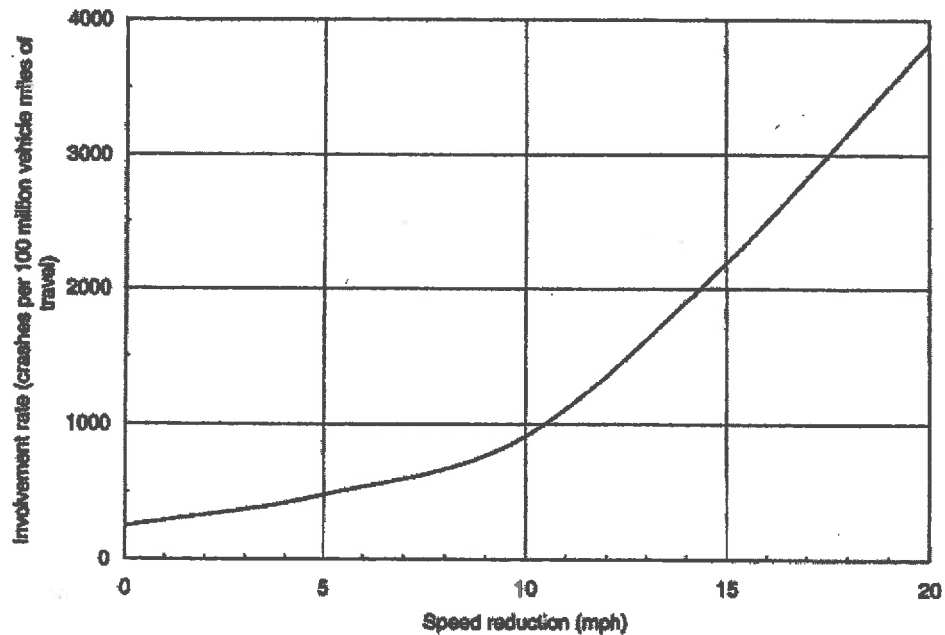
**Exhibit 3-57. Speed-Distance Curves for a Typical Recreational Vehicle on the Selected Upgrades (40)**

As discussed previously, deviation from average speed increases the chance a vehicle is involved in a crash. Exhibit 3-58 displayed below illustrates the exponential increase in crash involvement rates associated with speed reduction on critical grades.

---

**US CUSTOMARY**

---



**Exhibit 3-58. Crash Involvement Rate of Trucks for Which Running Speeds Are Reduced below Average Running Speed of All Traffic (41)**

With the total length of the proposed CR 595 being about 21 miles in length, MCRC is now proposing three northbound and two southbound passing lanes at appropriate locations and intervals to keep the traffic from clustering behind slow moving vehicles. The passing lane locations were chosen in areas of critical uphill grades where large trucks would be at their lowest speed. However, due to the relatively low traffic volumes expected on CR 595, the passing lanes do not have to be the MDOT standard of one mile in length. The AASHTO Greenbook describes the optimal length of a passing lane section to be 0.5 to 2.0 miles, with longer lengths of added lane appropriate where traffic volumes are higher. In this case, with lower traffic volumes, the proposed passing lanes can be (and are) shorter in certain instances.

After receiving the September 4, 2012 MDEQ letter, MCRC evaluated the four proposed CR 595 passing lanes to determine whether revisions could be made to reduce wetland impacts, especially impacts to S3 wetlands. As a result of this evaluation, MCRC is now proposing revisions to one of the four passing lanes (described as Passing Lane 3 below). Those revisions will reduce wetland impact for the passing lanes portions of CR 595 in those stretches from approximately 1.38 acres to approximately 1.08 acres, with a decrease in impacts to S3 wetlands from approximately 0.84 acres to approximately 0.68 acres. The details of the passing lanes and approximate acreages of wetland impacts are as follows:

Passing Lanes #1 and #2 remain the same.

Passing Lane #1 is northbound and was implemented on a long uphill grade (1.2 miles long) north of the Second River in an area where trucks would be slowed and passing could be accomplished in the most effective and safe manner. There is an S3 wetland A58 (HCS) in the middle of the first passing lane at about Sta. 358+00.

Passing Lane #2 is southbound and starts at Sta. 1299+00 south of the Dead River on a critical uphill grade (8%). This passing lane avoids wetland E2 (S3, RCS) except for the taper; to avoid wetland E2 would move the start of the passing lane uphill on a 8% grade which would not meet MDOT passing lane section design standards.

Passing Lane #1 (northbound): STA 319+00 to STA 383+00 RT:  
0.29 acres of S3 wetland

Passing Lane #2 (southbound): STA 1260+00 to STA 1299+00 LT:  
0.08 acres of non-S3 wetland  
0.12 acres of S3 wetland

While it is still very desirable from a traffic safety standpoint to maintain some form of passing lane in the vicinity of Passing Lane #3, the passing lane design in that area has been revised by creating two shorter northbound passing lane segments. There will be a shorter passing lane in the area originally proposed, and another passing lane south of the originally proposed passing lane. Those two revised passing lane segments are as follows (the first one is the new passing lane):

Passing Lane #3a (northbound): STA 1156+00 to STA 1190+50 RT  
0.01 acre of non-S3 wetland

Passing Lane #3b (northbound): STA 1360+00 to STA 1384+00 RT:  
0.11 acres of non-S3 wetland  
0.10 acres of S3 wetland

Passing Lane #4 remains the same. This passing lane is on the long, steep grade coming up from the Yellow Dog Plains toward the Mulligan Creek area and is not be revised due to safety concerns.

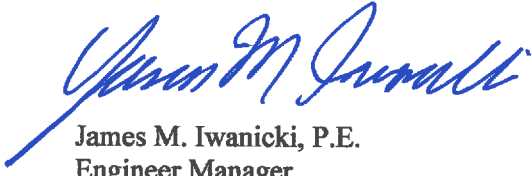
Passing lane #4 (southbound): STA 1591+00 to STA 1647+00 LT:  
0.24 acres of non-S3 wetland  
0.13 acres of S3 wetland

With the above explanation and submittal of revised plans, it is our hope that MDEQ can issue a draft modified permit for this project approving these revised project plans. With respect to the remaining items in your September 4, 2012 letter regarding our mitigation plan, as well as the draft conditions for a permit, we would like to discuss those matters in detail with MDEQ and EPA next week in our scheduled meetings.



Thank you for your continued coordination with MCRC regarding this important project.

Sincerely,



James M. Iwanicki, P.E.  
Engineer Manager

cc: Ms. Melanie Haveman, EPA (via email)

Enclosures:    Excerpt from "Geometric Design of Highways and Streets"  
                     MDOT document "Establishing Realistic Speed Limits"  
                     Revised Plan and Profile Drawings dated 9/13/12  
                     Revised Wetland Impact Spreadsheet dated 9/13/12